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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LEO I. RAINER and DAVID A. SPRINGER

Appeal 2007-3079
Application 09/802,883
Technology Center 3700

Decided: January 17, 2008

Before MURRIEL E. CRAWFORD, JENNIFER D. BAHR, and ANTON W. FETTING, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Leo I. Rainer et al. (Appellants) appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 32 through 44. Claims 1-31 have been canceled, and claims 45-51 have been withdrawn. We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

THE INVENTION

Appellants' claimed invention is directed toward an integrated climate control system that provides heating, ventilation cooling, air conditioning, and fresh air ventilation to a building (Spec. 6, ll. 15-16). The major components of the integrated climate control system include a sensor system, an air handling unit 9, an outside air damper 12, a hot water source 18, and a condensing unit 17 (Spec. 9, ll. 12-15 and fig. 1). The sensor system includes an outdoor temperature sensor 5, a control module 3, a wall display unit (WDU) 1, and an indoor temperature sensor (part of WDU 1) (Spec. 9, ll. 16-22, Spec. 10, l. 25, and fig. 1). The air handling unit 9 includes a heat exchange coil 10 having separate passages for hot water and refrigerant, and a circulating pump 16 (Spec. 9, ll. 23-25 and fig. 1). The hot water passages are connected to a heat source 18 by piping 20, whereas the refrigerant passages are connected to a condensing unit 17 by way of piping 19 (Spec. 10, ll. 4-6 and fig. 1).

Using indoor and outdoor temperature measurements from current and previous days, and statistical equations stored in the control module 3, the integrated climate control system calculates a predicted indoor temperature range 23 for the next day that represents the minimum and the maximum indoor predicted temperatures 22 and 24, respectively (Spec 10, ll. 9-16 and fig. 2). With the WDU 1 set to "cooling", the user can set a predetermined temperature range defined by a minimum and a maximum acceptable temperature (Spec. 6, ll. 24-27). Specifically, the "Set Low" button allows a user to set the minimum acceptable temperature 21 (also defined as the ventilation cooling low limit temperature), whereas the "Set Hi" button 27 allows the user to set the maximum acceptable temperature 25 (also defined

as the air conditioning temperature) (Spec. 6, ll. 24-27, Spec. 10, ll. 7-10, and fig. 2). In operation, when the indoor temperature exceeds the maximum acceptable temperature 25, then indoor air enters the damper 12, passes through heat exchange coil 10 that is cooled by the condensing unit 17, and is supplied to the building through air outlet 9a (Spec. 11, ll. 9-13). If the indoor temperature falls below the minimum acceptable temperature 21, hot water is circulated between the heat exchange coil 10 and the heat source 18, and air drawn from the building is heated by the heat exchange coil 10 and delivered to the building through air outlet 9a (Spec. 11, ll. 15-18). When the outdoor temperature falls below the indoor temperature by more than a preset temperature differential, ventilation cooling is activated where air handling unit 9 causes outside air to enter the damper 12, pass through filter 12d, and flow to the building through air outlet 9a that is connected to ducts which convey cool air to all the rooms in the building. If the indoor temperature falls below the minimum predicted temperature 22 or if the outdoor temperature exceeds the difference between the indoor temperature and the preset differential temperature, ventilation cooling is terminated (Spec. 10, l. 24 through Spec. 11, l. 5).

Claim 32 is illustrative of the claimed invention and reads as follows:

> 32. A system for using outside ventilation air to maintain indoor comfort and air quality, comprising:
>
> a sensor system for detecting outdoor and indoor air temperatures;
>
> an air delivery system for delivering the outside ventilation air to an interior space; and

a controller, operably connected to the sensor system and the air delivery system, that:

receives an outdoor air temperature and an indoor air temperature detected by the sensor system;

stores the detected outdoor air temperature and the detected indoor air temperature detected by the sensor system;

calculates a predicted indoor temperature range and a predicted outdoor temperature range based on the stored outdoor air temperature and the stored indoor air temperature; and

regulates operation of the air delivery system as a function of predicted indoor and outdoor air temperature ranges and a predetermined indoor air temperature range.

THE REJECTION

The Examiner relies upon the following as evidence of unpatentability:

Nakamura	US 4,775,944	Oct. 4, 1988

The following rejections are before us for review:

Claim 41 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

Claims 32 through 44 stand rejected under 35 U.S.C. §102(b) as anticipated by Nakamura.

The Examiner provides reasoning in support of the rejections in the Answer (mailed October 12, 2006). Appellants present opposing arguments in the Appeal Brief (filed March 7, 2006). A Reply Brief has not been filed.

FACTS

Nakamura

We make the following findings of fact with respect to Nakamura:

1. Nakamura discloses a control system for controlling a centralized air conditioning and/or hot water supply system for multiple dwelling units including an outdoor weather information sensor 1 for measuring the outdoor temperature and humidity, a data base 2 which stores weather information, a central heat source 3 having a controller 5 and an operating state sensor 4, and an information processor 6 (controller) (col. 2, ll. 16-32 and fig. 1).

2. In each dwelling unit the control system of Nakamura further includes an indoor sensor 11 for measuring the temperature and humidity of the room, a user input terminal device 13 for operating a controller 12, a user output terminal device 14 for displaying messages from information processor 6, and an air conditioning apparatus 8 that includes a water boiler for supplying hot water, a controller 12, and an operating state sensor 10 (col. 2, ll. 36-47 and fig. 1).

3. The control system of Nakamura calculates optimum operating conditions of the air conditioning and/or hot water supply system using the operating status information of the central heating source, the outdoor weather information, the indoor atmosphere information, and user instructions, and then displays the resulting optimum operating conditions on the user's output terminal device (col. 4, ll. 1-13).

4. A weather predicting portion 15 forecasts the weather for the day (predicted temperature and humidity) based on information from the weather

data base 2 (weather model) and the weather sensor 1 (outdoor temperature and humidity) (col. 3, ll. 15-18 and fig. 3).

5. A heat load estimating portion 16 estimates the total heat which may be consumed in the dwelling units using the information from the forecasted weather portion 15 (predicted temperature and humidity), the indoor sensor 11, user instructions from input terminal device 13, the operating state sensor 4 of central heat source 3, and the operating state sensor 10 of the air conditioning apparatus 8 (col. 3, ll. 19-27 and fig. 3).

6. A suppliable energy calculation portion 17 calculates the required amount of energy taking into consideration the present operating state, the capacity of the central heating system, and the heat storage state (col. 3, ll. 28-32 and fig. 3).

7. An optimum operating condition portion 18 calculates the optimum operating conditions of the central heat source 3 in such a manner as to make the heat load of the central heat source 3 even and save energy, and displays the optimum operating conditions on output terminal device 14 (col. 3, ll. 33-43 and fig. 3).

8. After reading the calculated optimum operating conditions on the output terminal device 14, the user enters the optimum operating conditions into the input terminal device 13. If the user inputs new operating conditions, after comparing the new operating conditions with optimum operating conditions, the information sensor 6 will generate a new message indicating the advantages or disadvantages of the new operating conditions (col. 3, ll. 6-13 and 44-66).

DISCUSSION

The Indefiniteness Rejection

The test for definiteness under 35 U.S.C. § 112, second paragraph, is whether "those skilled in the art would understand what is claimed when the claim is read in light of the specification." *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.,* 806 F.2d 1565, 1576 (Fed. Cir. 1986) (citations omitted). A claim may be invalid for indefiniteness if it is "insolubly ambiguous" and not "amenable to construction." *Exxon Research & Eng'g Co. v. United States,* 265 F.3d 1371, 1375 (Fed. Cir. 2001).

Claim 41, which depends from claim 32, recites "[t]he system of claim 32 further comprising an air conditioner." The Examiner's basis for the rejection, as articulated on page 4 of the Answer, is that "the limitation 'further comprising an air conditioner'…represents a double recitation of the air delivery system already recited in base claim 32…since the air delivery system encompasses an air conditioner." The Examiner concludes that "the air handling unit or AHU 9 which constitutes at least a part of the air delivery system as recited in base claim 32 *IS* an air conditioner" (Ans. 4) (capitalization in original). "[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). Here, the term "delivery" means to "convey" (*Merriam Webster's Collegiate Dictionary* 306 (Tenth Ed. 1997)). That is, the limitation of an "air delivery system" merely requires a system for conveying air from one place to another. As such, a person of ordinary skill in the art would understand that the limitation of an "air delivery

system," when read in light of the Specification, may or may not include an air conditioning unit. Specifically, a person of ordinary skill in the art would understand an "air delivery system" as used in claim 41 to mean a system for conveying air such as, for example, a system including damper 12, duct 11, blower motor 15, and air outlet 9a. Hence, we find that the limitation of claim 41 merely narrows the scope of base claim 32 by reciting the additional feature of the air conditioner.

In light of the above, we conclude that claim 41 is not "insolubly ambiguous" and is "amenable to construction." It follows that claim 41 is not invalid for indefiniteness. As such, the rejection of claim 41 cannot be sustained.

The Anticipation Rejection

Appellants argue all the claims rejected under 35 U.S.C. §102(b) together as a group. Therefore, in accordance with 37 C.F.R. 41.37(c)(1)(vii), we have selected claim 32 as the representative claim to decide the appeal of the anticipation rejection, with claims 33 through 44 standing or falling with claim 32.

The issue presented in this appeal is whether Appellants have demonstrated that the Examiner erred in determining that the subject matter of claims 32-44 is anticipated by Nakamura.

The crux of Appellants' argument is that the Examiner has erred in not giving patentable weight to the functional limitations of the controller (App. Br. 15-16). Specifically, Appellants contends that Nakamura does not disclose a controller that is *operably connected* to a sensor system and an air delivery system that: (a) calculates a predicted outdoor temperature range;

(b) calculates a predicted indoor air temperature range; (c) stores an outdoor air temperature; (d) stores an indoor air temperature; and (e) regulates operation of the air delivery system as a function of the predicted indoor and outdoor temperature range, and a predetermined indoor air temperature range (App. Br. 14).

A functional limitation is often used in association with an element, ingredient, or step of a process to *define a particular capability* or purpose that is served by the recited element, ingredient or step. In *Innova /Pure Water Inc. v. Safari Water Filtration Sys. Inc*., 381 F.3d 1111, 1117-20 (Fed. Cir. 2004), the court noted that the claim term "operatively connected" is "a general descriptive claim term frequently used in patent drafting to reflect a functional relationship between claimed components," that is, the term "means the claimed components must be connected in a way to perform a designated function." As such, a functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used.

We agree with Appellants that the Examiner has erred in not giving patentable weight to the functional limitations of the controller. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California,* 814 F.2d 628, 631 (1987). Here, Nakamura discloses a control system (controller), including a controller 12 and an information sensor 6 which are operably connected to an air conditioning apparatus 8 (air delivery system), an indoor sensor 11, and an outdoor weather information sensor 1 (Findings of Fact 1 and 2).

The control system of Nakamura forecasts the weather for the day using a measured outdoor temperature and a weather model (Finding of Fact 4), hence calculating a predicted outdoor temperature range (step a). Further, the control system calculates optimum operating conditions using the outdoor weather information provided by the outdoor weather information sensor 1 and the indoor atmosphere information provided by the indoor sensor 11 (Finding of Fact 3). Accordingly, the controller of Nakamura stores the outdoor and indoor air temperatures (steps c and d). Although Nakamura discloses a step of calculating an estimated (predicted) heat load that may be consumed in the dwelling units (Finding of Fact 5), we do not find that Nakamura specifically teaches that the controller calculates a predicted indoor temperature (step b). Similarly, although Nakamura teaches that a user may input instructions to the control system (Findings of Fact 5 and 8) we do not find that Nakamura specifically teaches a predetermined indoor air temperature range (step e). It is not clear from Nakamura what type of instructions the user may input into the control system.

Because Nakamura does not teach each and every element as set forth in claim 32, either expressly or inherently, we find that the Examiner has not made a prima facie case of anticipation as to claims 32 through 44. Therefore, the rejection cannot be sustained.

REMAND TO THE EXAMINER

The application is remanded to the Examiner, pursuant to 37 C.F.R. § 41.50(a)(1) for appropriate action with regard to the following issue.

While we reverse the rejection under 35 U.S.C. § 102(b), we remand the application to the Examiner to consider whether claim 32 in particular would have been unpatentable over Nakamura, alone or in combination with other prior art, given that Nakamura discloses a step of calculating an estimated (predicted) heat load that may be consumed in the dwelling units (Finding of Fact 5). "A person of ordinary skill is also a person of ordinary creativity, not an automaton." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1742 (2007). That is, the calculation of the heat load that may be consumed in the dwelling units requires knowing the temperature differential of the dwelling units, hence requires knowing the predicted outdoor and indoor temperatures in order to calculate the temperature differential. Such a calculation would not have been challenging to one of ordinary skill in the art.

We further note that the control system of Nakamura allows a user to input instructions to the control system (Findings of Fact 5 and 8). The types of user instructions that are commonly input to an indoor temperature controller (thermostat) include temperature settings and humidity levels that provide a comfortable environment for the user. Reading the disclosure of Nakamura, one of ordinary skill in the art would foresee that the user input instructions in the controller of Nakamura may include a predetermined temperature range that provides such a comfortable environment. The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at 1739. Upon remand, the Examiner is ordered to take into consideration the above remarks and evaluate the patentability of the claims, and claim 32 in

particular, over Nakamura in light of those remarks and the guidance provided by *KSR*.

SUMMARY

The decision of the Examiner to reject claim 41 under 35 U.S.C. § 112, second paragraph and claims 32 through 44 under 35 U.S.C. § 102(b) is reversed. The application is remanded to the Examiner for the reasons set forth above.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2006).

REVERSED AND REMANDED

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